



Maryland Public Health Strategy for Climate Change

Wicomico County Site Visit

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Director, Environmental Health Bureau
Prevention and Health Promotion
Administration

November 4, 2013
Salisbury, MD



Site Visit Agenda

11:00 – 11:15 am	Welcome/Introductions
11:15 – 11:30 am	Overview of Climate Change Project, Site Visit Goals
11:30 am – 12:15 pm	Discussion of Local Health Data, Priorities, Possible Contributions of DHMH Climate Change Project
12:15 – 12:30 pm	Environmental Health Data Portal Demonstration
12:30 – 12:45 pm	Next Steps
12:45 – 1:00 pm	Wrap-Up



GOALS

- Review overall project
- Discuss Wicomico County Local Health Priorities
- Discuss ways in which climate change might affect local priorities
- Identify products (forecasts, models) that might assist WCHD in achieving its goals
- Discuss one possible regional project (asthma)



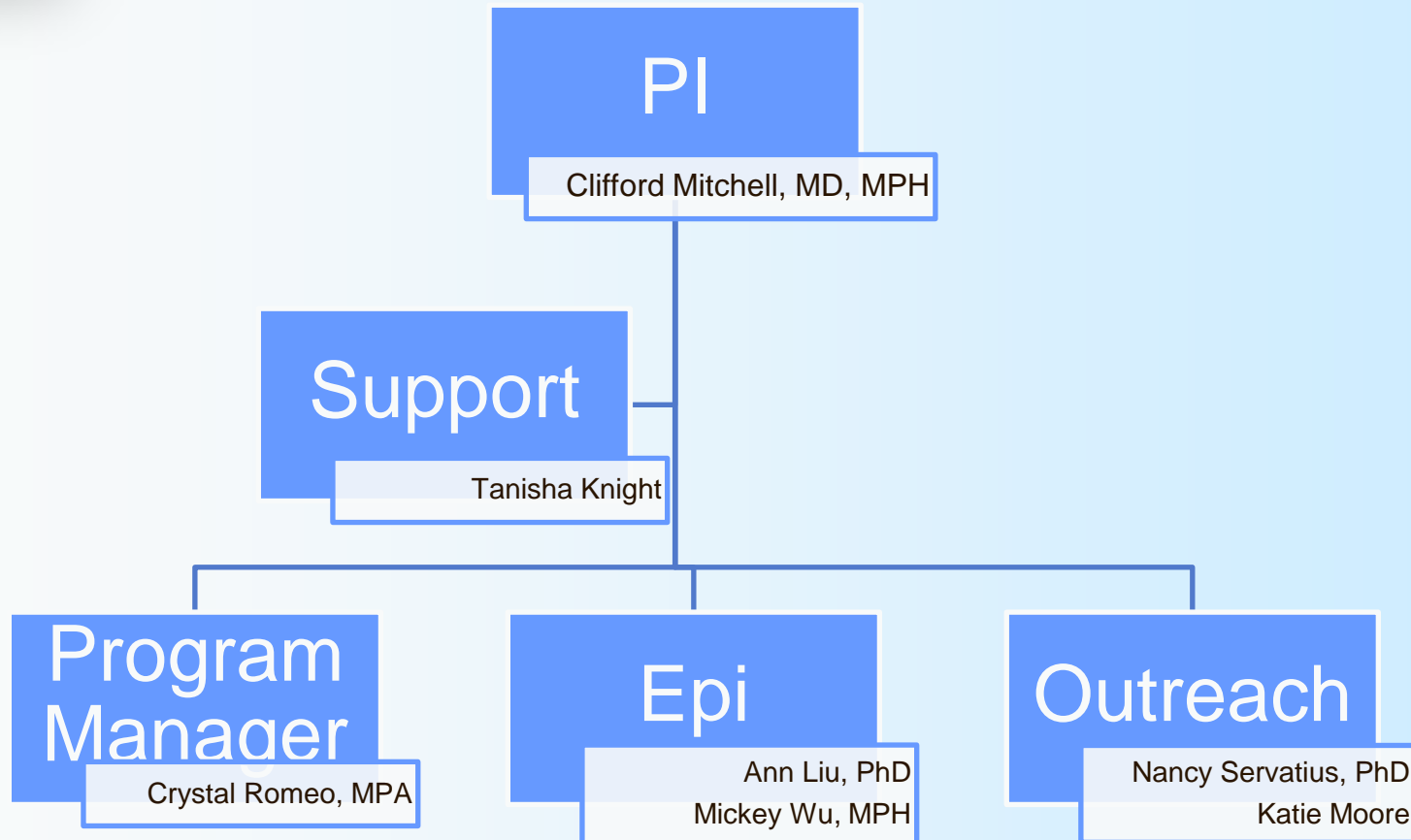
Welcome and Introductions

● PROJECT TEAM

- Maryland Department of Health and Mental Hygiene
- University of Maryland College Park
- CDC
- Other Partners



Climate Change Project

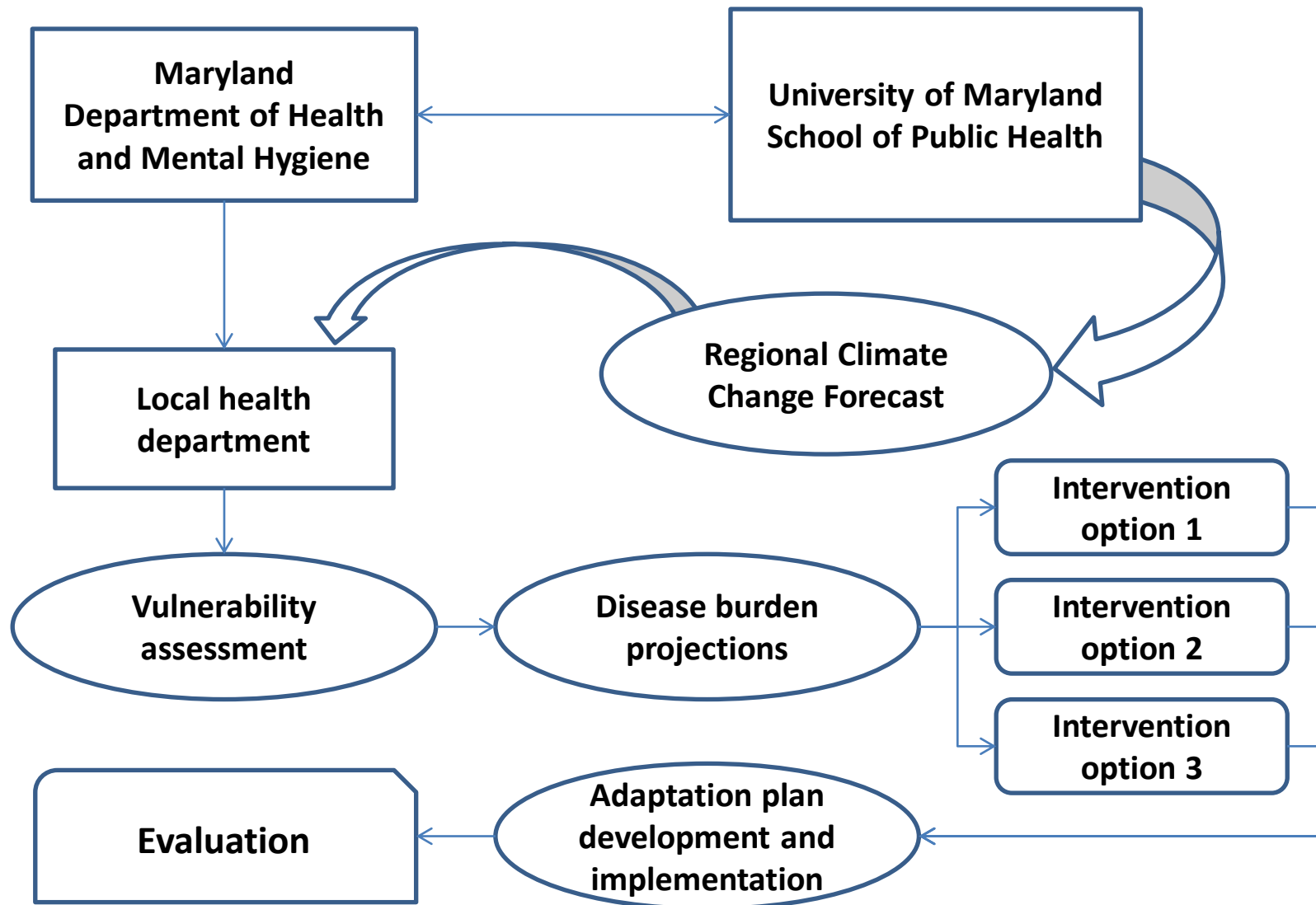


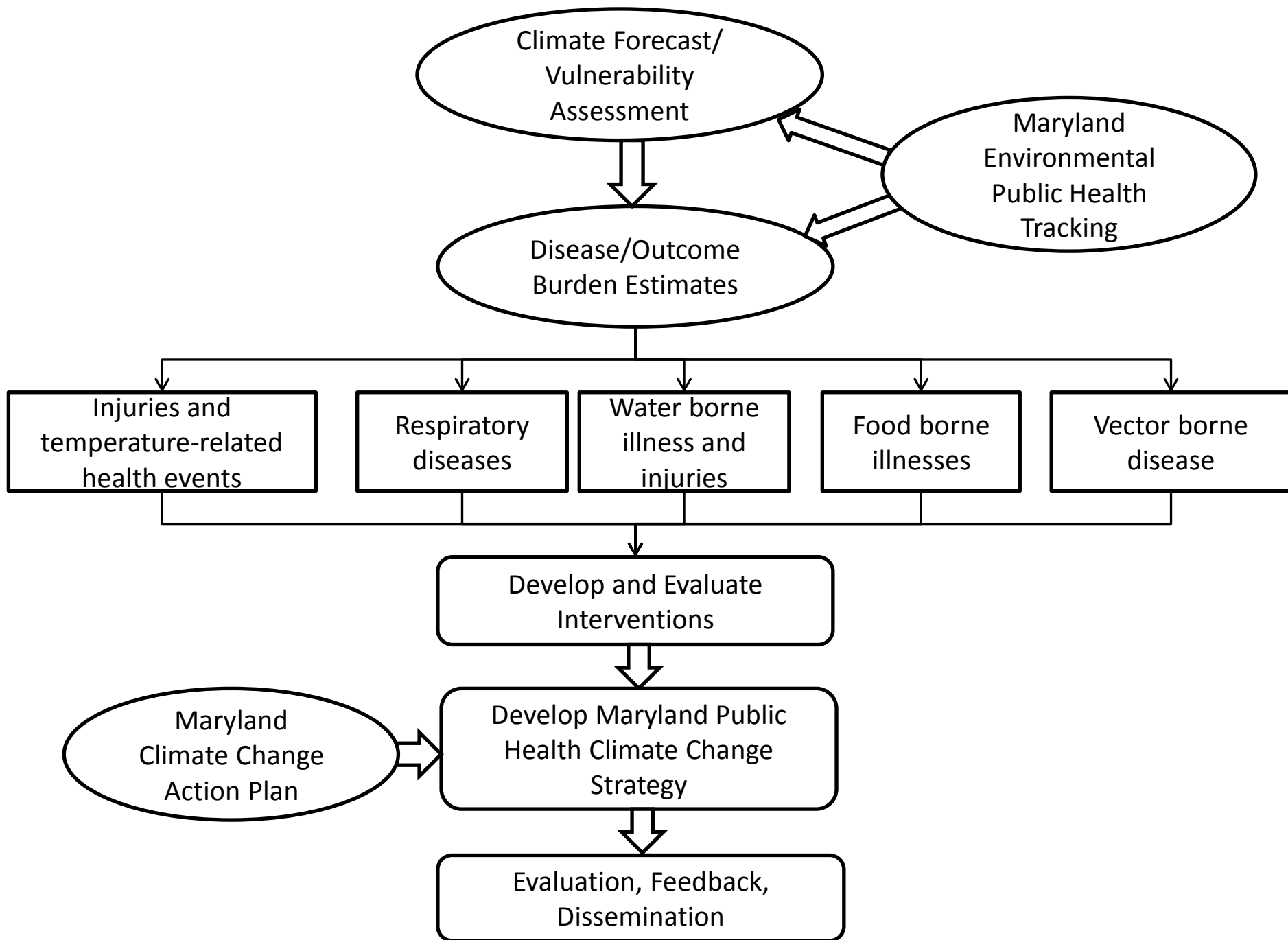


Maryland Public Health Strategy for Climate Change

- Based on CDC BRACE framework (building resistance against climate effects)
- 4 year cooperative agreement
- Also operates within context of Maryland Climate Change Action Plan

Maryland Public Health Climate Change Strategy







Goals	Objectives	Timeline	Performance Metric(s)
1. Prepare a Climate Forecast and Vulnerability Assessment	1.1 Prepare climate forecast	9/1/2012 – 8/31/2013	Forecast products for selected regional, local jurisdictions
	1.2 Vulnerability assessment	11/1/2012 – 8/31/2013	Mapping of vulnerable populations, quantitative vulnerability assessment
2. Project Disease/ Outcome Burden	2.1 Injuries and Temperature-Related Health Events	9/1/2013 – 3/31/2014	Metrics for each selected disease or outcome
	2.2 Respiratory Diseases		
	2.3 Water Borne Illness		
	2.4 Food Borne Illness		
	2.5 Vector Borne Disease		
3. Develop and Evaluate Public Health Interventions	3.1 Develop interventions	1/1/2014 – 8/31/2014	Detailed written description of interventions
	3.2 Assessment of public health interventions using health impact assessment framework	3/1/2014 – 2/28/2015	Formal health impact assessment of strategies/ interventions
4. Develop Maryland Public Health Climate Strategy	4.1 Develop written strategy document within Maryland Climate Change Action Plan framework	3/1/2015 – 8/31/2015	Strategy document
	4.2 Obtain feedback from key stakeholders	9/1/2015 – 2/29/2016	Written feedback incorporated in strategy document
	4.3 Adopt and promulgate strategy	3/1/2016 – 8/31/2016	Promulgation on DHMH website, other media
5. Evaluation of Maryland Public Health Climate Change Strategy	5.1 Develop evaluation framework using common evaluation tools and framework	9/1/2014 – 8/31/2016	Evaluation using criteria adopted by DHMH, Maryland Climate Change Commission



Local Public Health Department Mini-grants

- Enable public health professionals in local health departments (LHDs) to utilize climate forecast projections
- Help LHDs implement climate mitigation and/or adaptation strategies necessary to protect public health
- Evaluate the mitigation and/or adaptation strategy used to determine the quality of improvement and to incorporate refined inputs



Local Public Health Department Projects

- Proposals developing in Fall, 2013
 - Baltimore City
 - Prince Georges County
 - Washington County
 - Wicomico County



Health Statistics (Wicomico County)



Provided by

Ann Liu, PhD, MPH

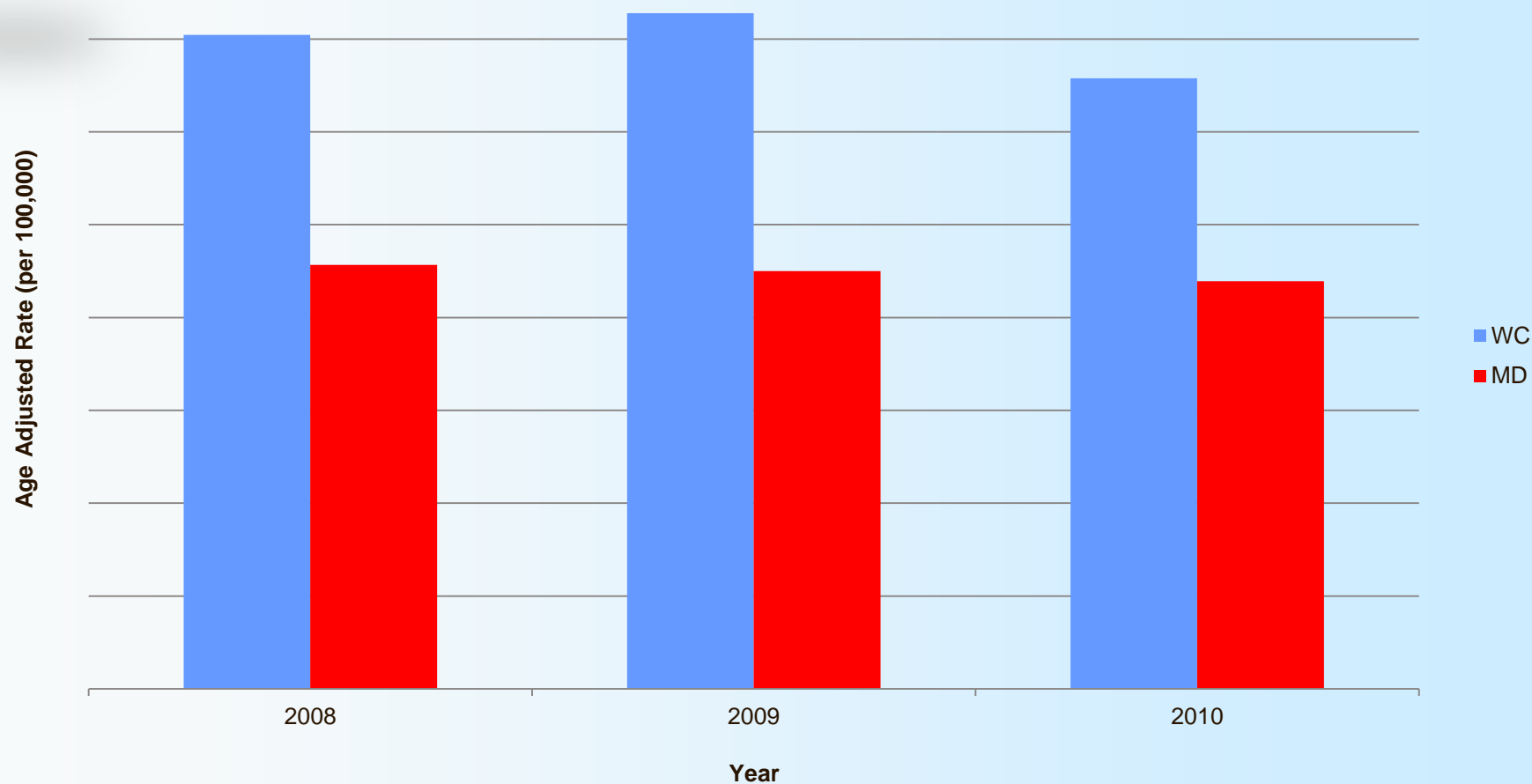
Mickey Wu, MPH

Elizabeth Young, MPH

PRELIMINARY BASELINE HEALTH STATISTICS



Total Injury Rates ED Visits



Data source: Injuries in Maryland: Statistics on Injury-related Emergency Department Visits, Hospitalizations, and Deaths Report (years 2008-2010*)
Age-adjusted rates of total injuries (per 100,000 population)

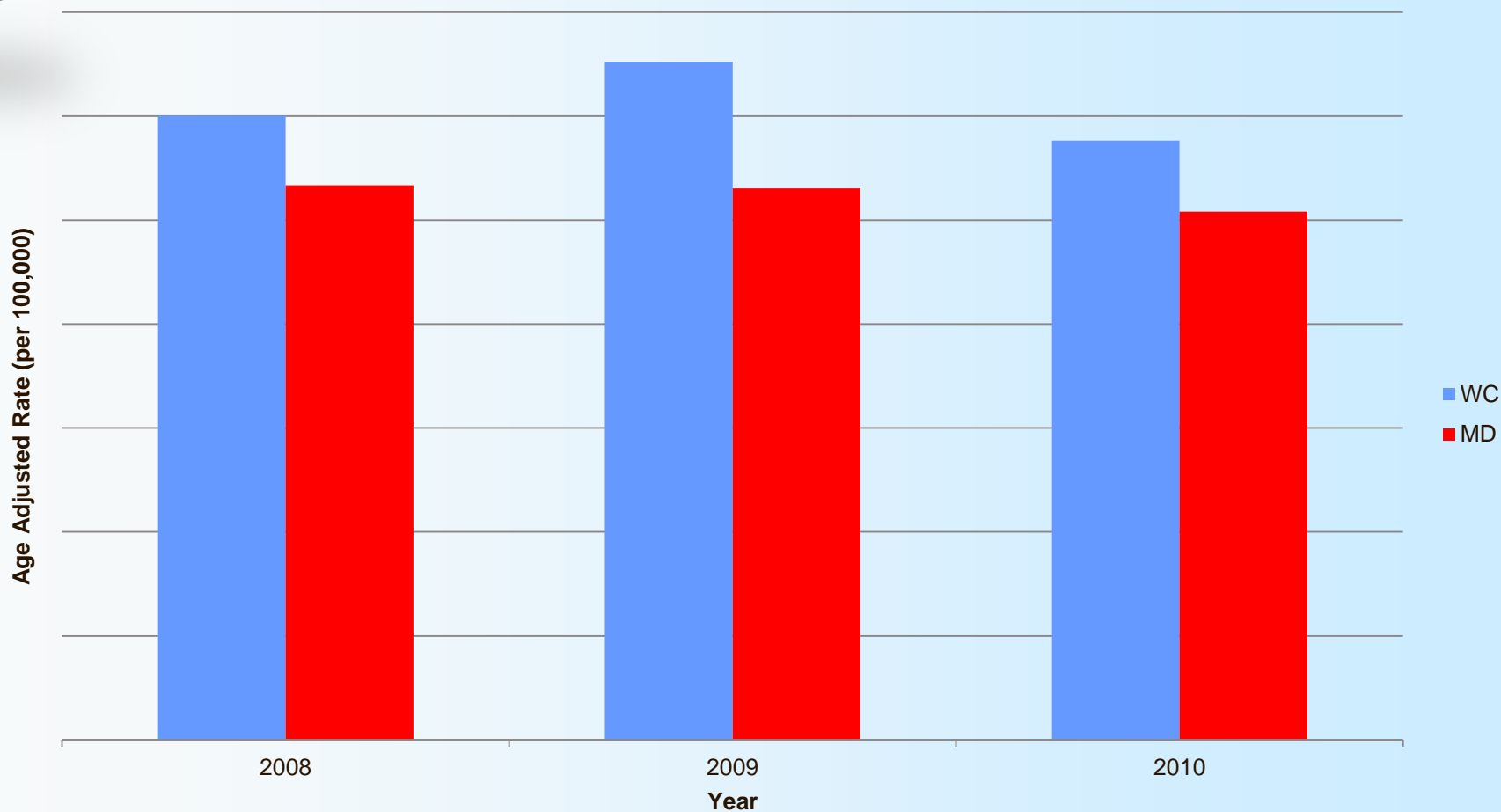
*Data by jurisdiction not available until 2008; report not available for 2011

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Total Injury Rates Hospitalization



Data source: Injuries in Maryland: Statistics on Injury-related Emergency Department Visits, Hospitalizations, and Deaths Report (years 2008-2010*)
Age-adjusted rates of total injuries (per 100,000 population)

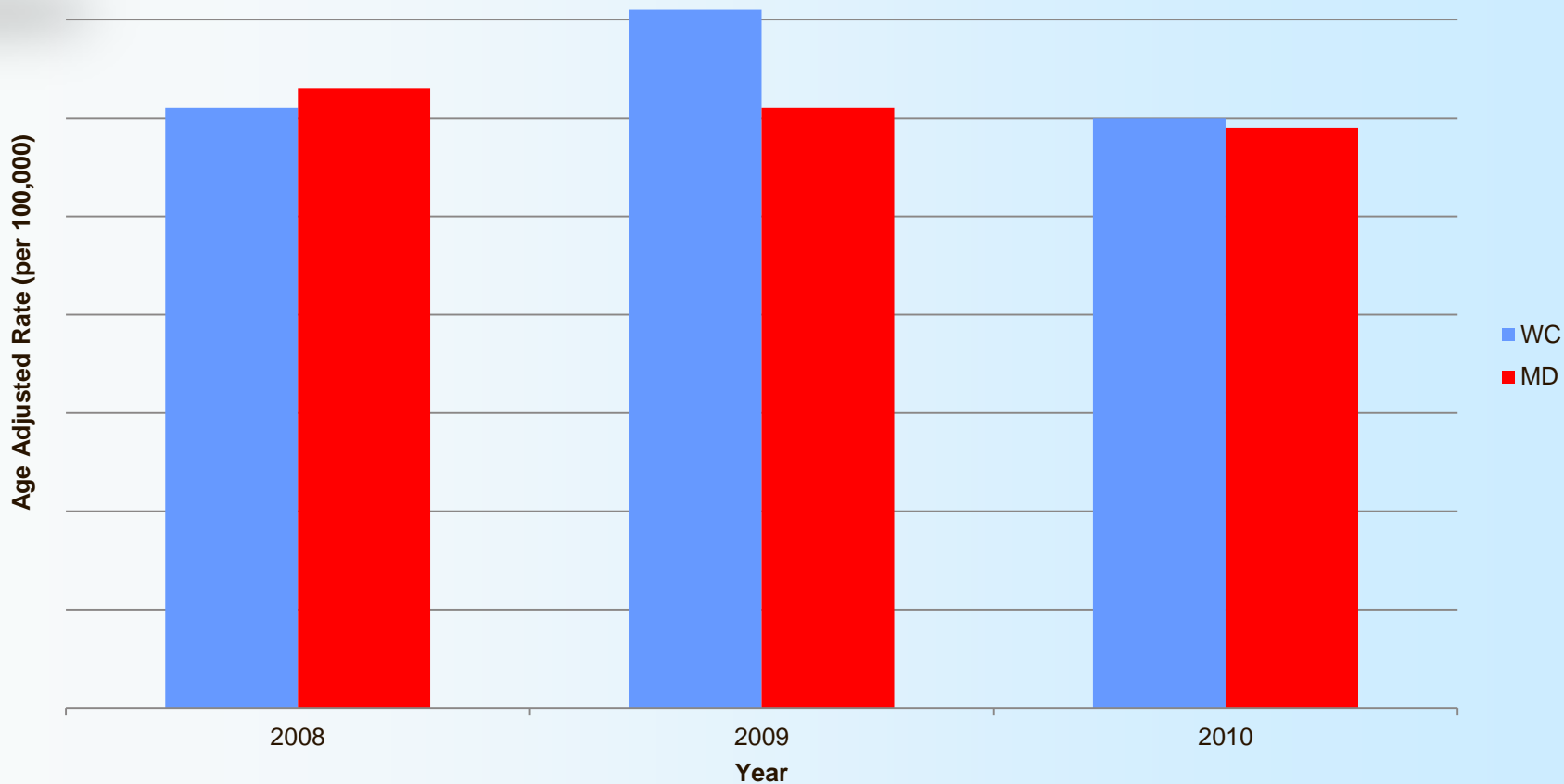
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Total Injury Rates Deaths



Data source: Injuries in Maryland: Statistics on Injury-related Emergency Department Visits, Hospitalizations, and Deaths Report (years 2008-2010*)
Age-adjusted rates of total injuries (per 100,000 population)

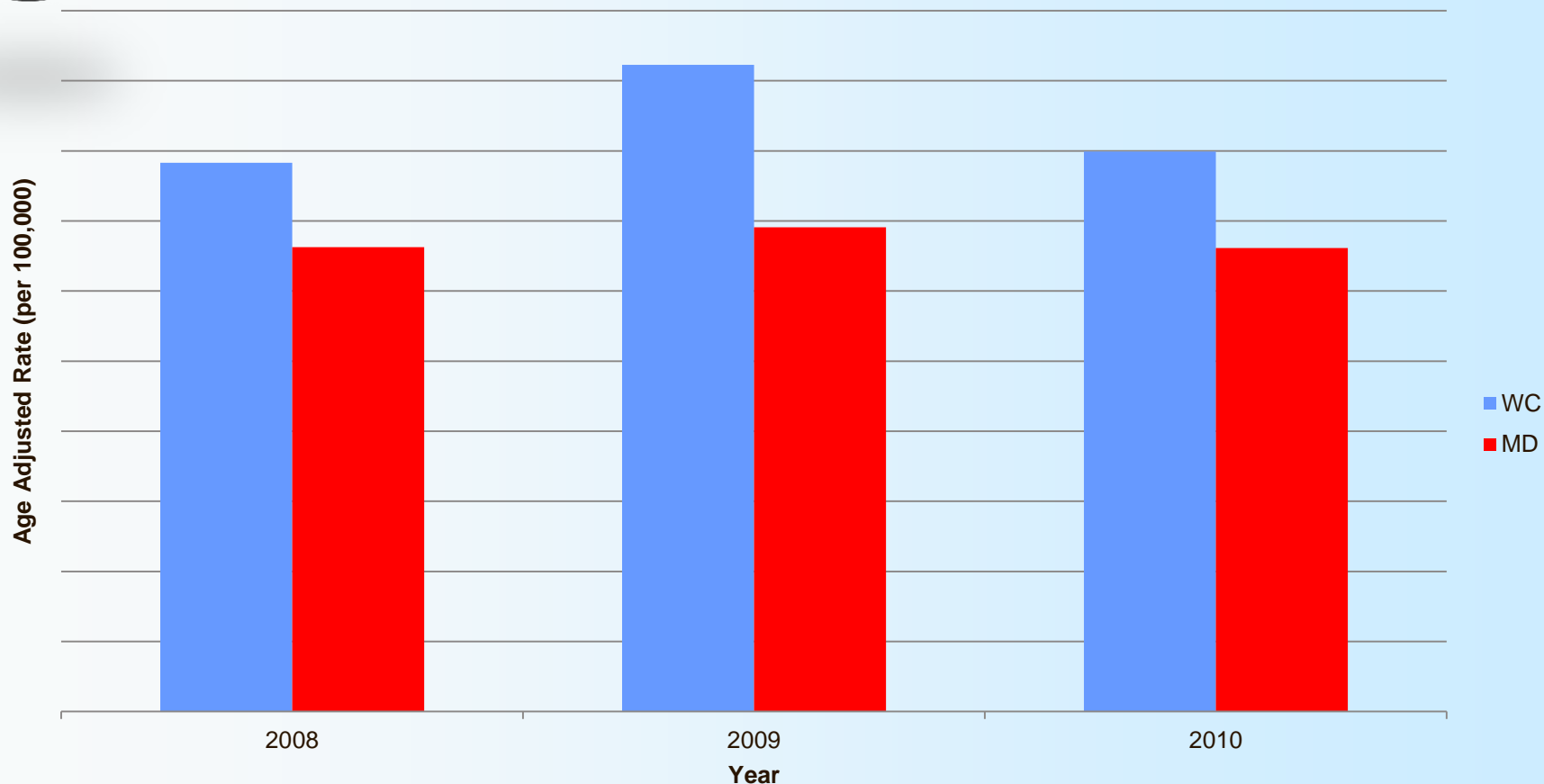
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Motor Vehicle Injuries ED Visit



Data source: Injuries in Maryland: Statistics on Injury-related Emergency Department Visits, Hospitalizations, and Deaths Report (years 2008-2010*)
Age-adjusted rates of total injuries (per 100,000 population)

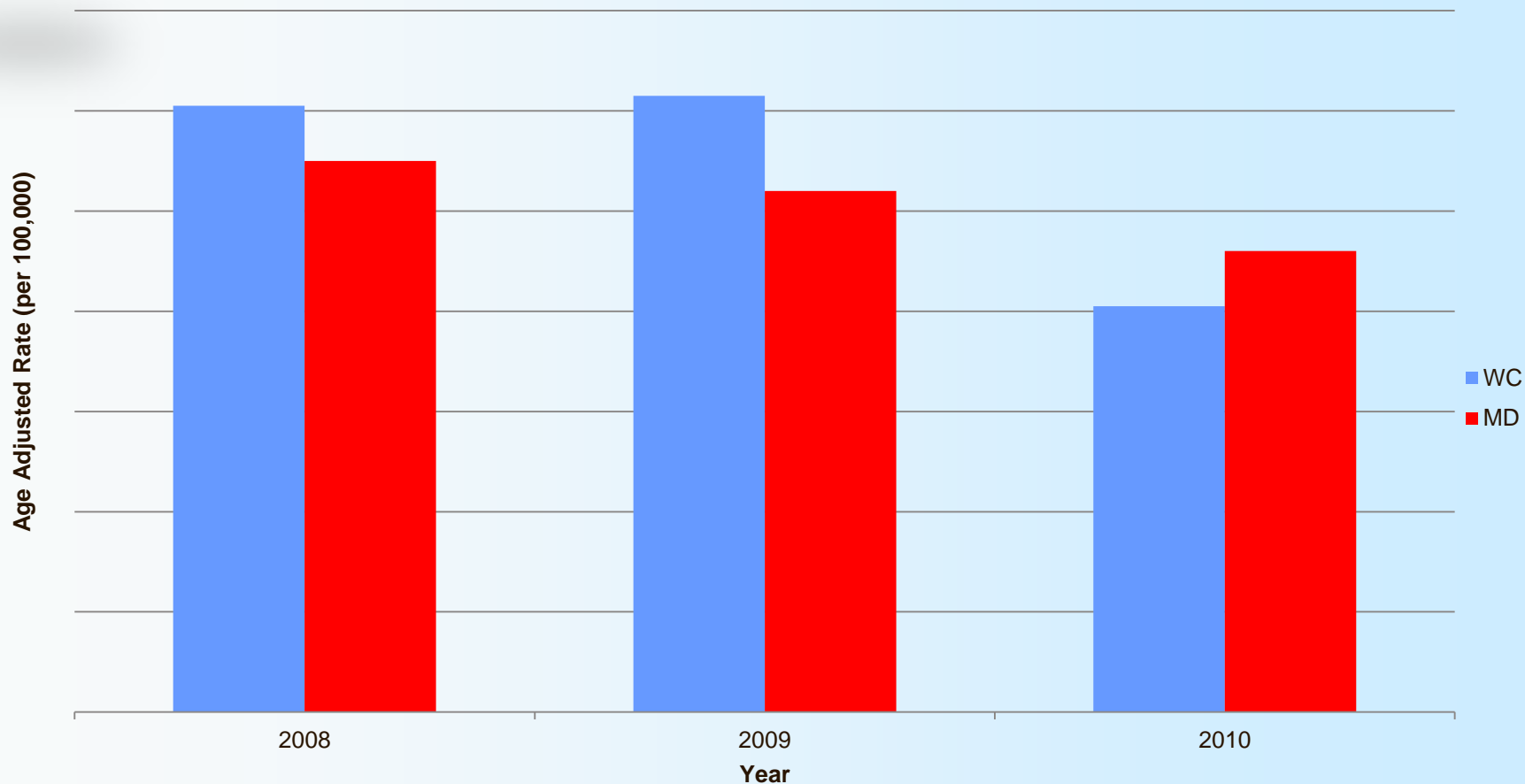
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Motor Vehicle Injuries Hospitalization



Data source: Injuries in Maryland: Statistics on Injury-related Emergency Department Visits, Hospitalizations, and Deaths Report (years 2008-2010*)
Age-adjusted rates of total injuries (per 100,000 population)

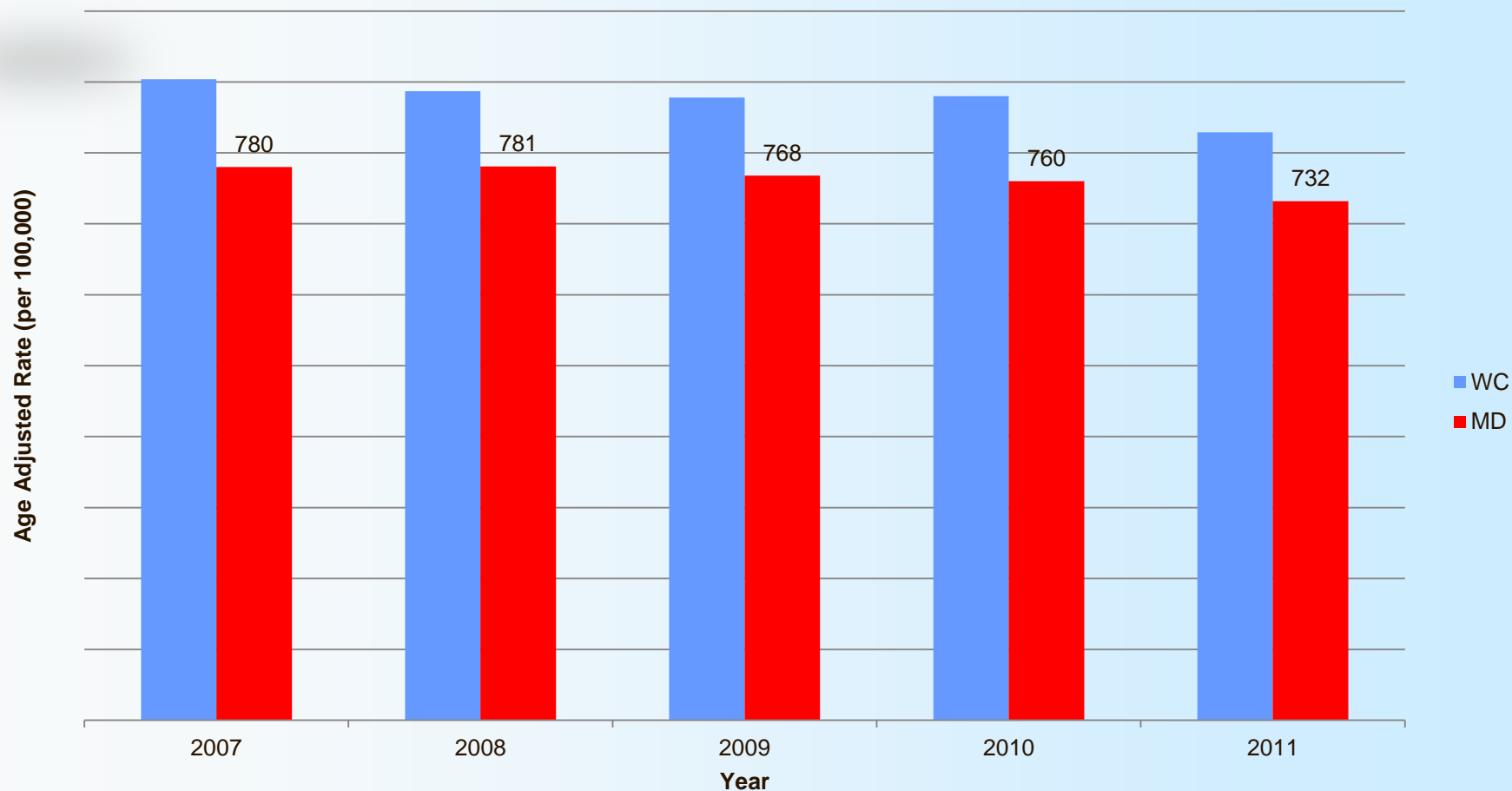
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All-Cause Mortality



Data source: Injuries in Maryland: Statistics on Injury-related Emergency Department Visits, Hospitalizations, and Deaths Report (years 2008-2010*)
Age-adjusted rates of total injuries (per 100,000 population)

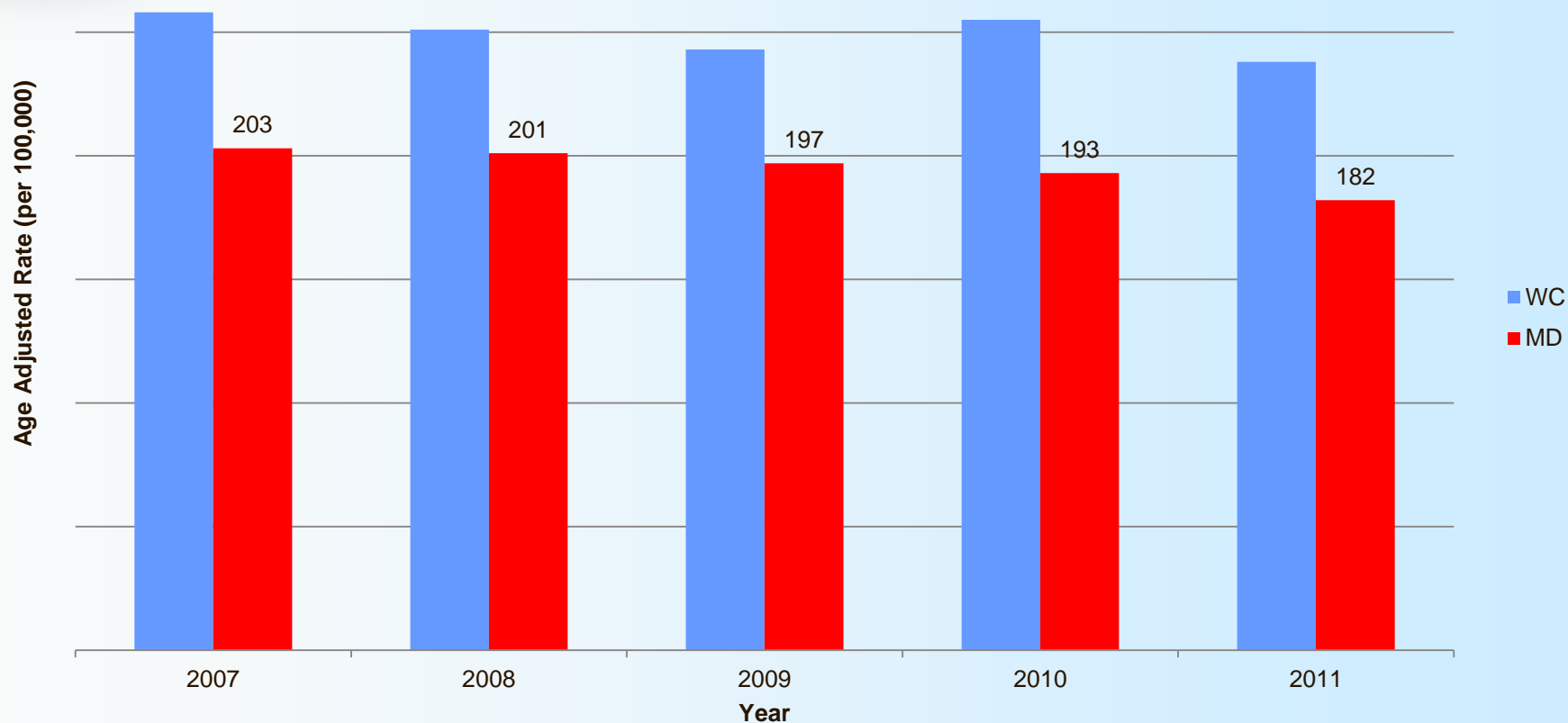
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Mortality – Heart Disease



Data source: Injuries in Maryland: Statistics on Injury-related Emergency Department Visits, Hospitalizations, and Deaths Report (years 2008-2010*)
Age-adjusted rates of total injuries (per 100,000 population)

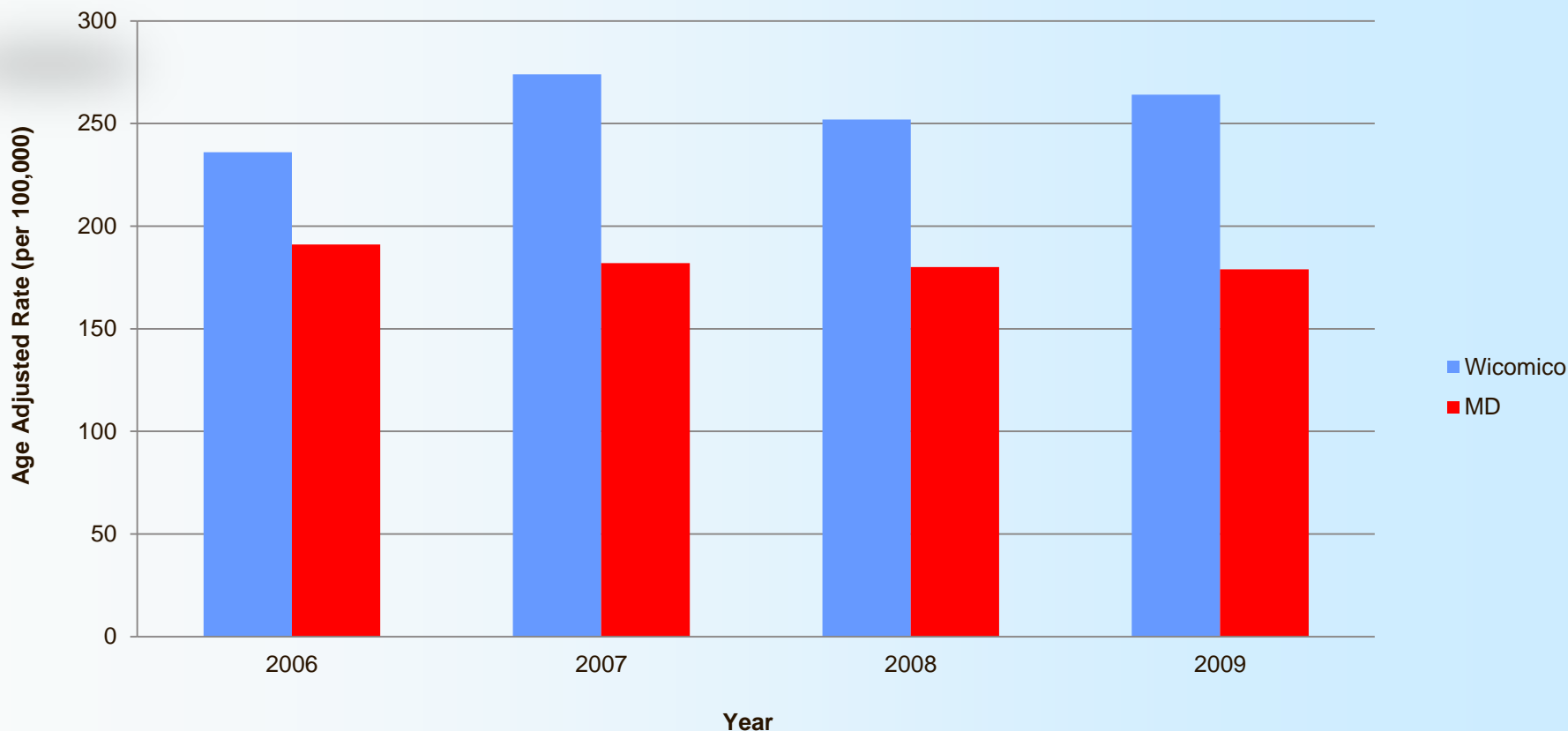
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Acute MI for Wicomico County ED Visits



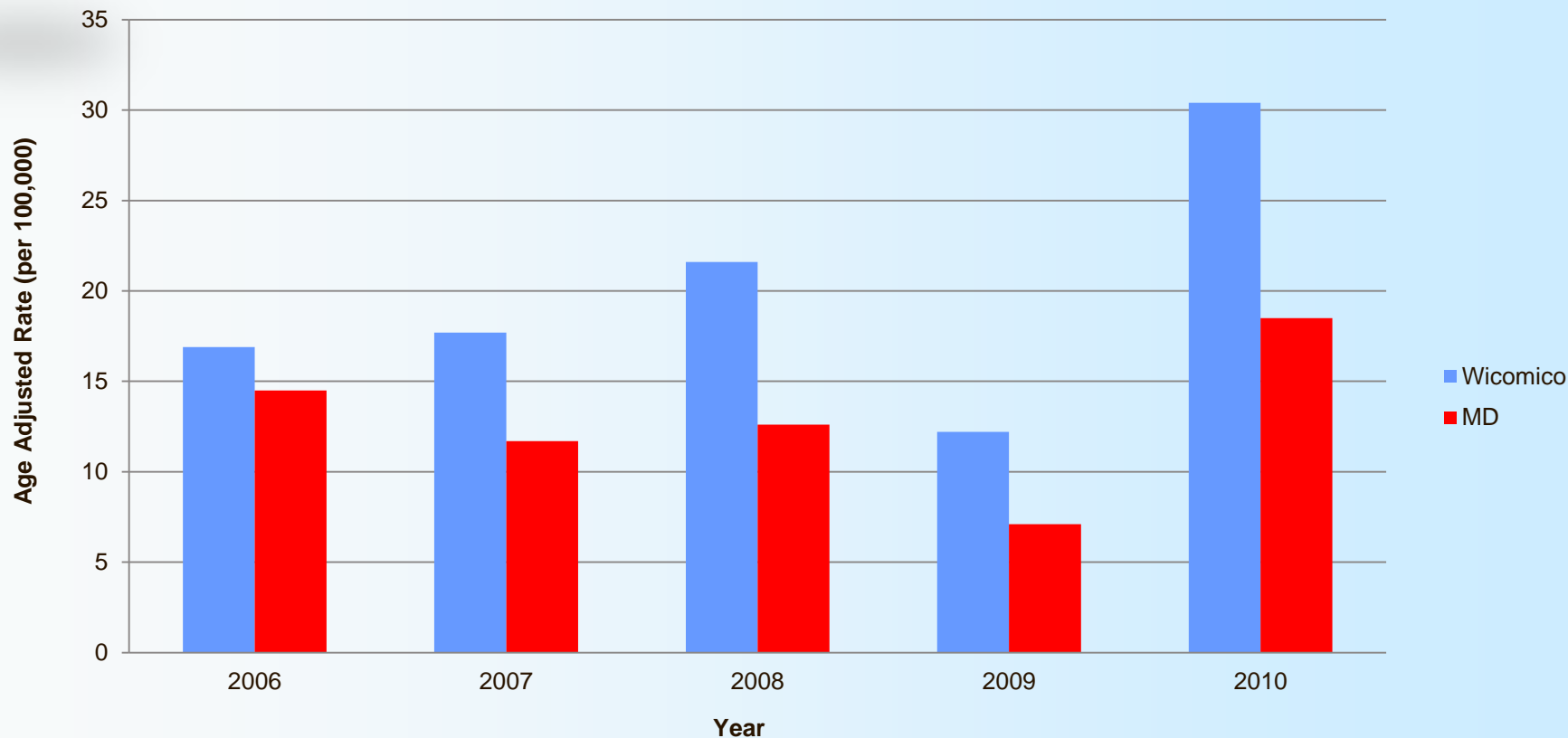
Data source: ED visits of Acute MI from DHMH EPHT: Infectious Disease and Environmental Health Administration (years 2007-2009)

<http://eh.dhmd.gov/idehaweb/query.aspx>

All rates are age-adjusted rate per 100,000 population



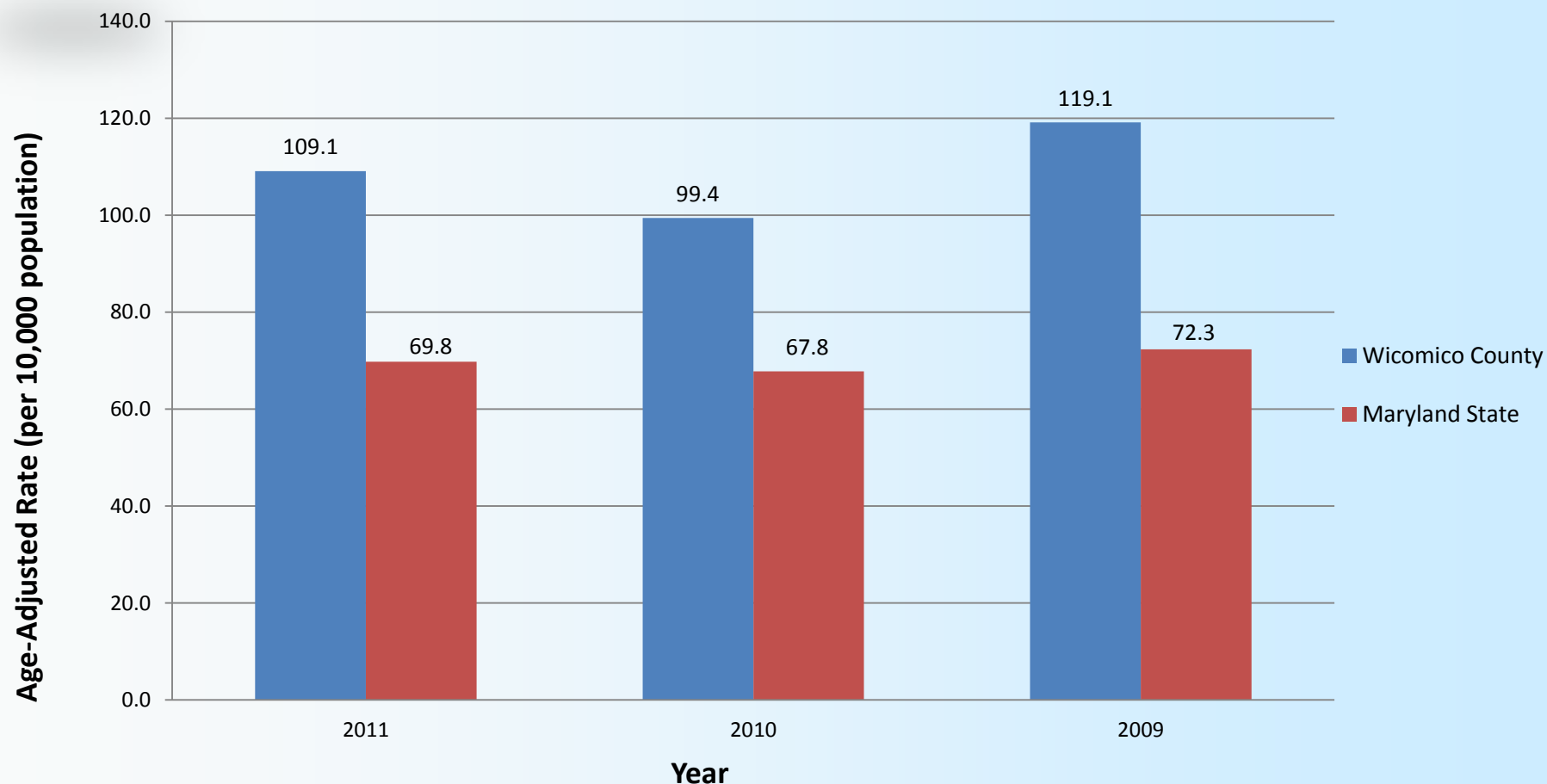
Heat Stress for Wicomico County ED Visits



Data source: DHMH Environmental Public Health Tracking: Heat Stress Indicator
Age-adjusted rates of heat stress (per 100,000 population)

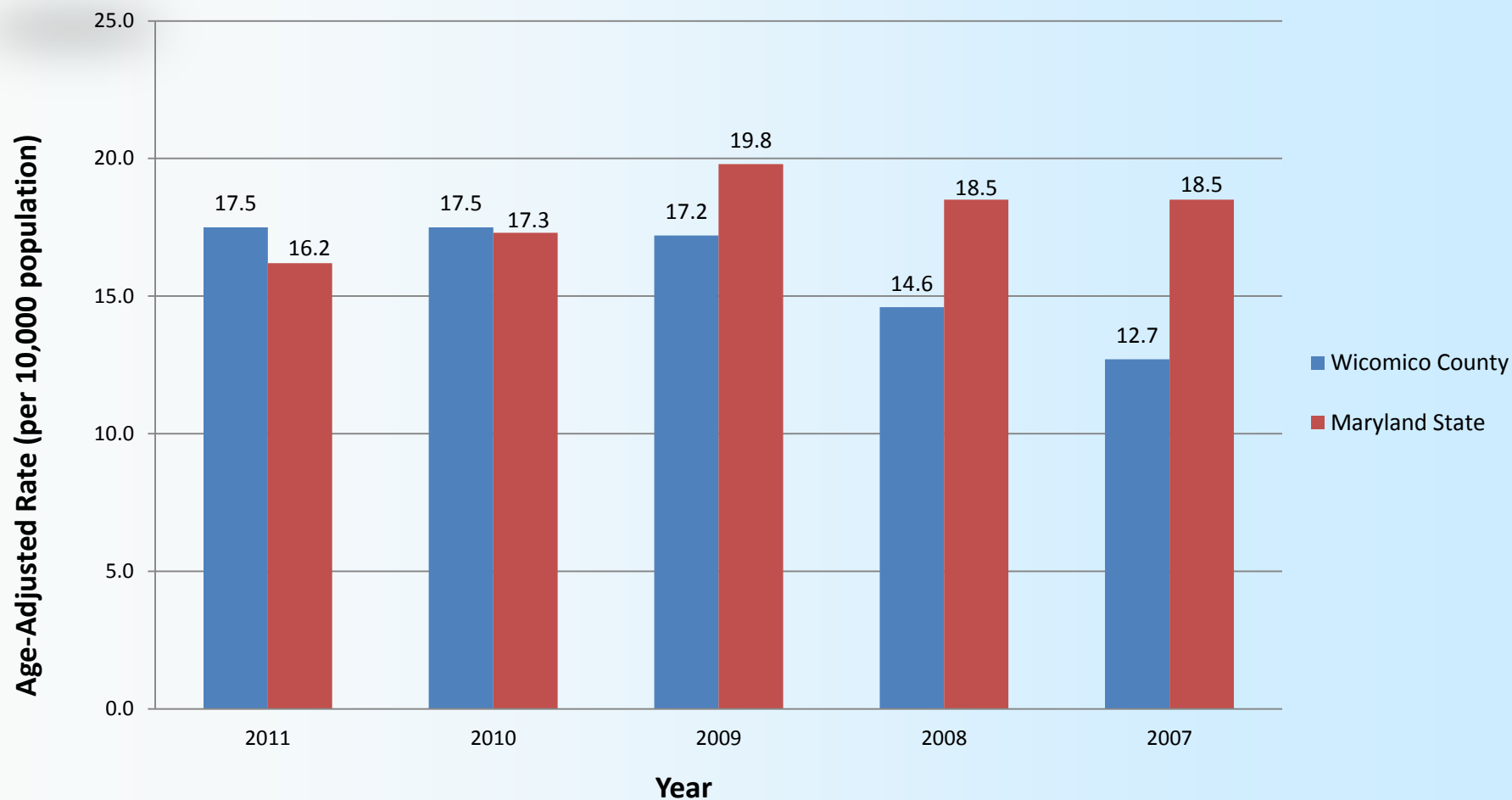


Asthma Emergency Department (ED) Visits





Asthma Inpatient Hospitalizations



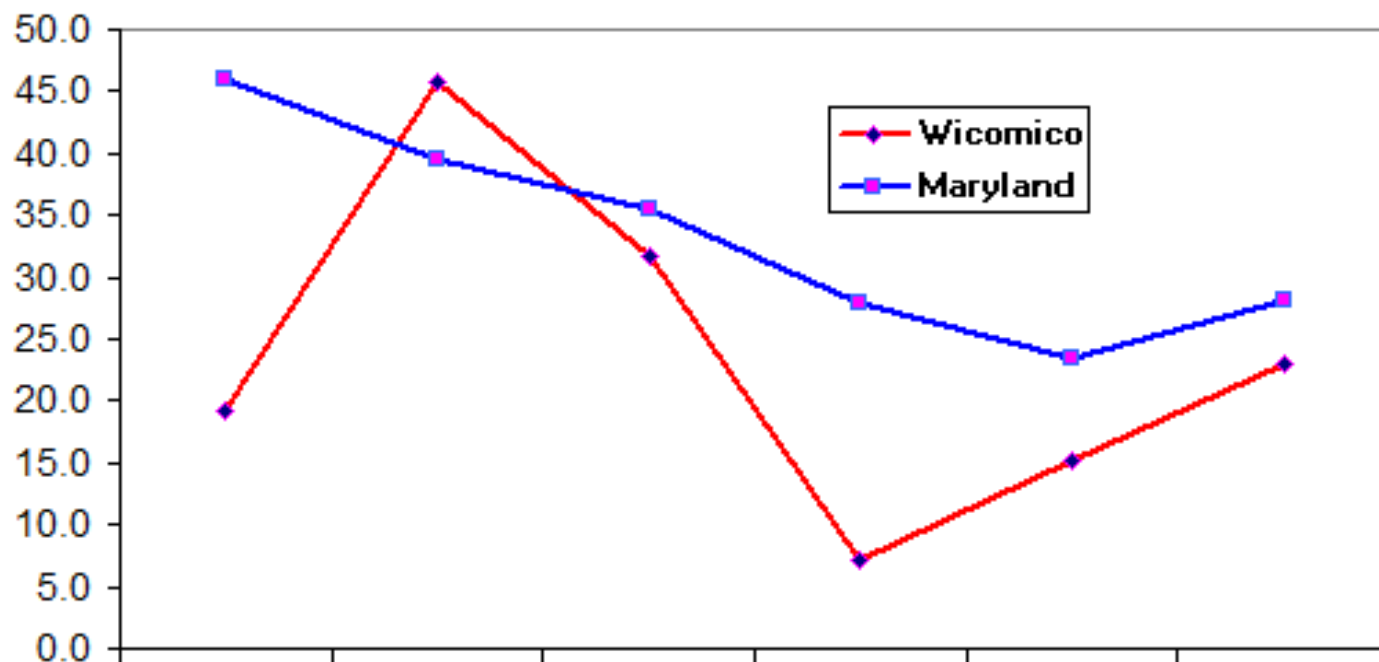
Data source: Maryland HSCRC. Age-adjusted rates per 10,000 population

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Lyme Disease Incidence

Lyme Disease Incidence Wicomico County, Maryland 2007-2012
per 100,000 population



◆ Wicomico
 ■ Maryland

2007

2008*

2009*

2010*

2011*

2012*

19.2

45.7

31.8

7.1

15.2

22.9

45.9

39.4

35.5

28.0

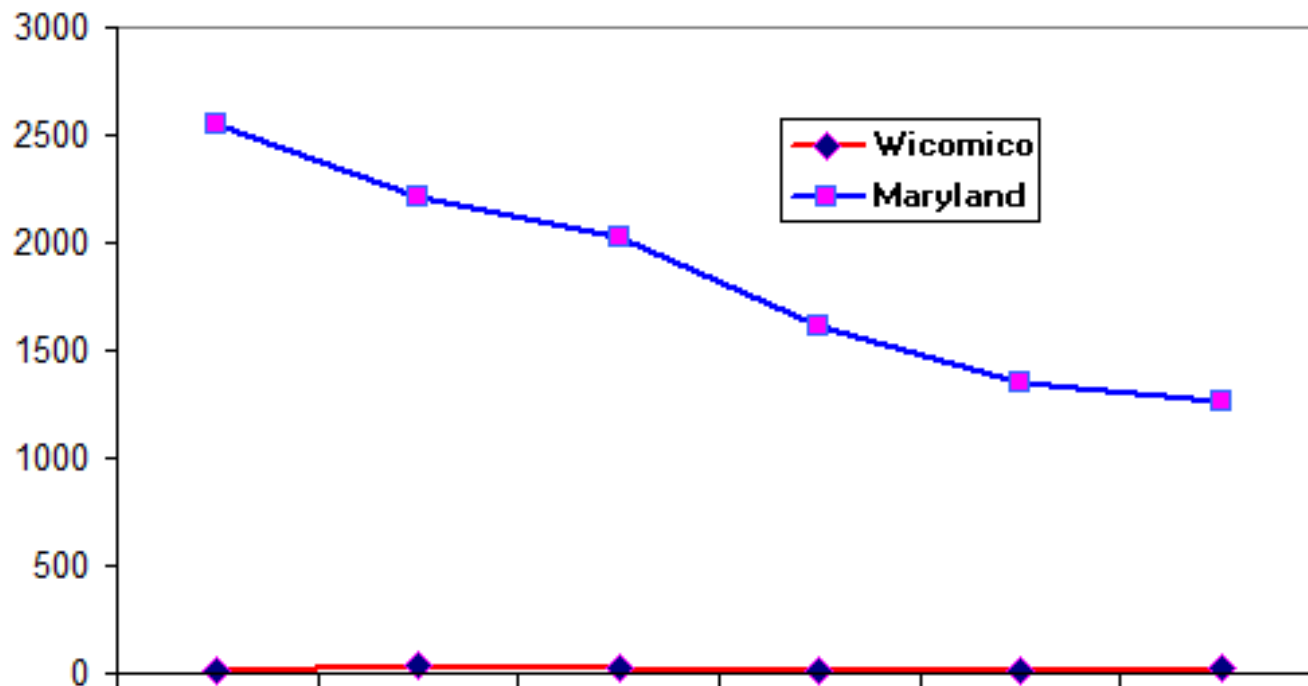
23.4



28.1



Lyme Disease Cases

Lyme Disease Cases Wicomico County, Maryland 2007-2012



 Wicomico
 Maryland

	2007	2008*	2009*	2010*	2011*	2012*
Wicomico	18	42	30	7	15	23
Maryland	2547	2216	2024	1617	1351	1259



Climate Change Projections (Wicomico County)



Provided by University of Maryland School of Public Health

Amir Sapkota, PhD

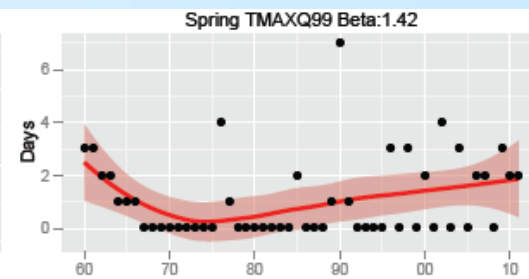
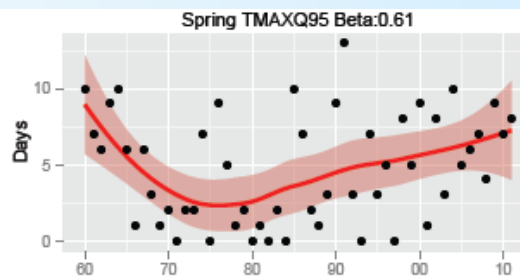
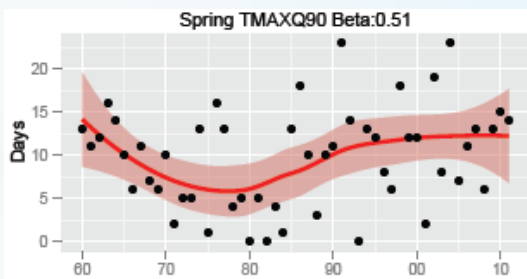
Chengsheng Jiang, PhD

EXCESSIVE HOT DAYS

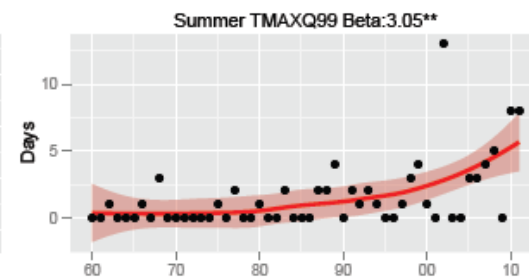
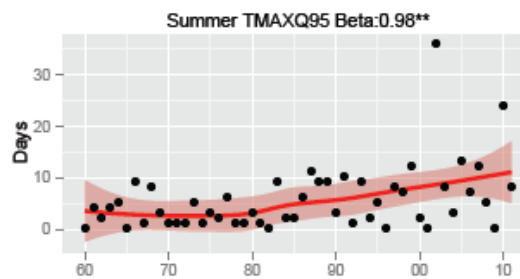
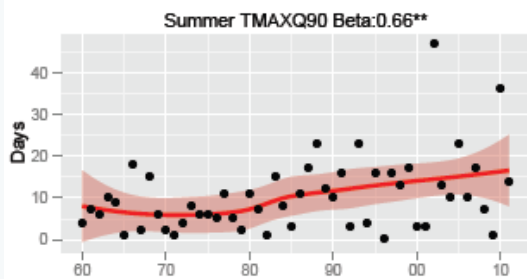


Seasonal Temperature Anomalies

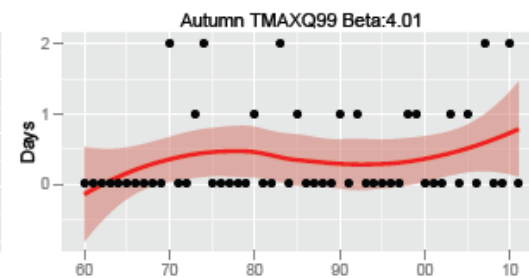
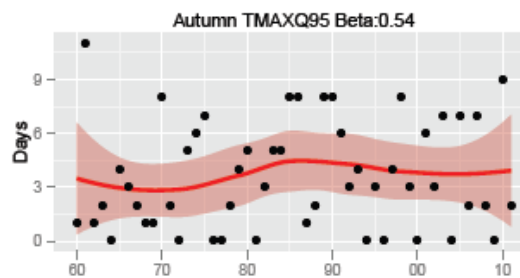
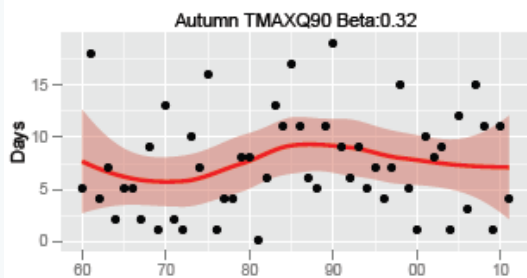
Spring



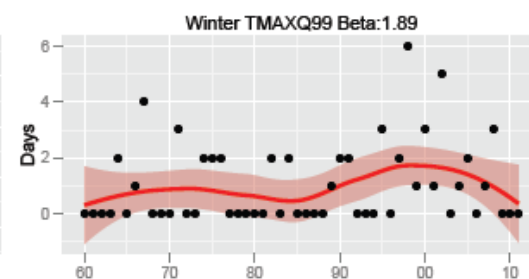
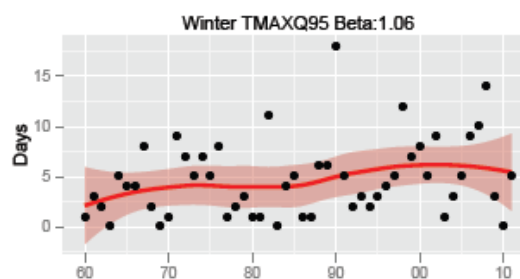
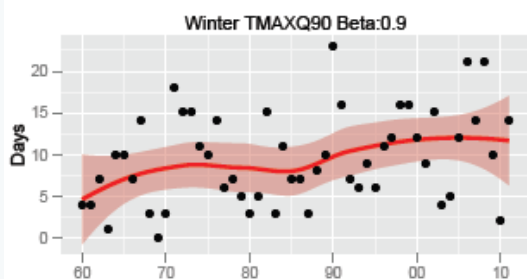
Summer



Autumn



Winter

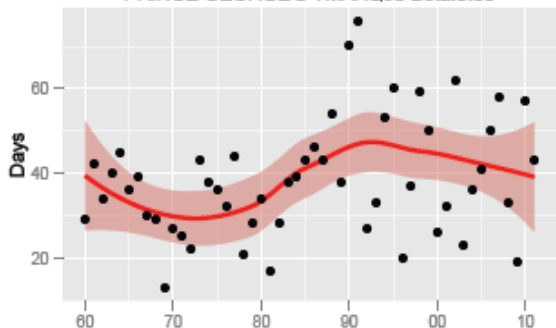




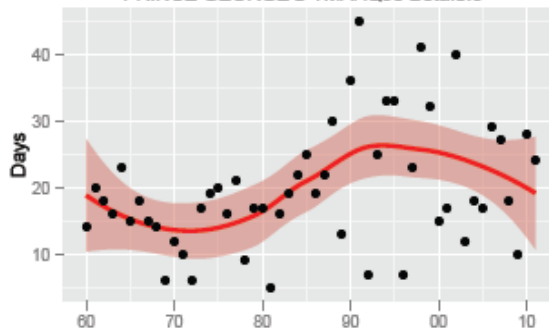
Annual Hot Temperature Anomalies

Prince Georges

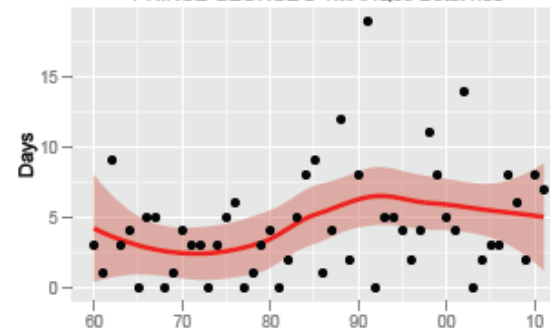
PRINCE GEORGE'S TMAXQ90 Beta:0.33



PRINCE GEORGE'S TMAXQ95 Beta:0.6**

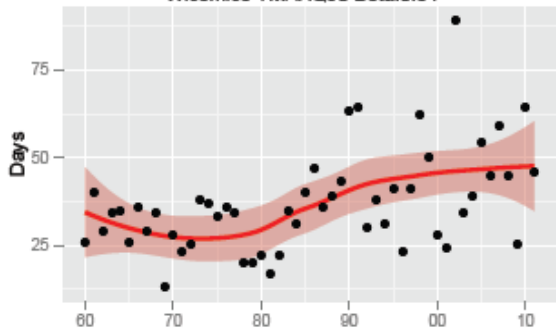


PRINCE GEORGE'S TMAXQ99 Beta:1.08

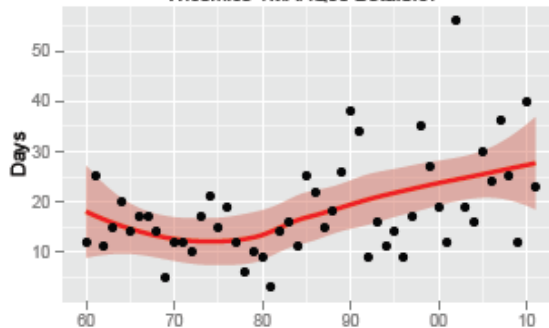


Wicomico County

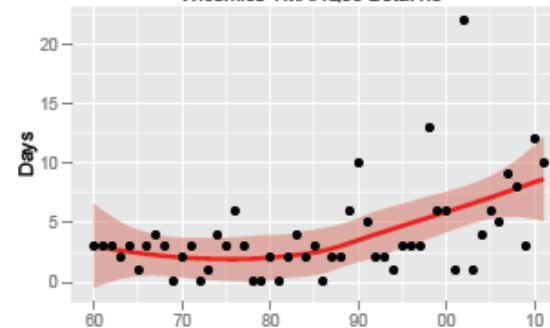
Wicomico TMAXQ90 Beta:0.51**



Wicomico TMAXQ95 Beta:0.67**

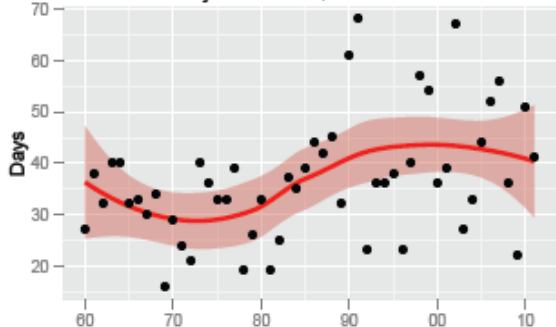


Wicomico TMAXQ99 Beta:1.8**

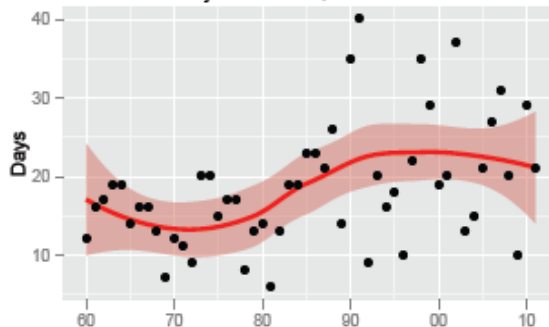


Maryland

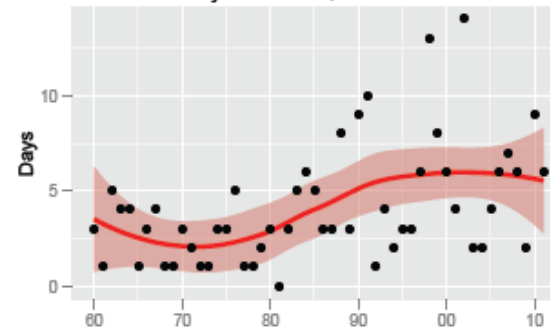
Maryland TMAXQ90 Beta:0.51**



Maryland TMAXQ95 Beta:0.83**



Maryland TMAXQ99 Beta:2.28**





Provided by Environmental Public Health Tracking (EPHT)

John Braggio, PhD, MPH

Mickey Wu, MPH

POLLEN INDICATOR



Pollen Indicator Overview

- CSTE/SEHIC Climate Change Indicator for Pollen (Jan 14, 2013)
- Significance & Background
 - Pollen can adversely influence respiratory health outcomes, such as asthma
 - Future climate change pollen increases, total spores and selected spore types such as ragweed, could result in an increase in respiratory diseases
- Rationale for pollen indicator development
 - A standardized pollen indicator could be of use to both public health professionals and practitioners through the linkage of pollen with asthma and allergic rhinitis



Pollen Indicator Overview, Cont.

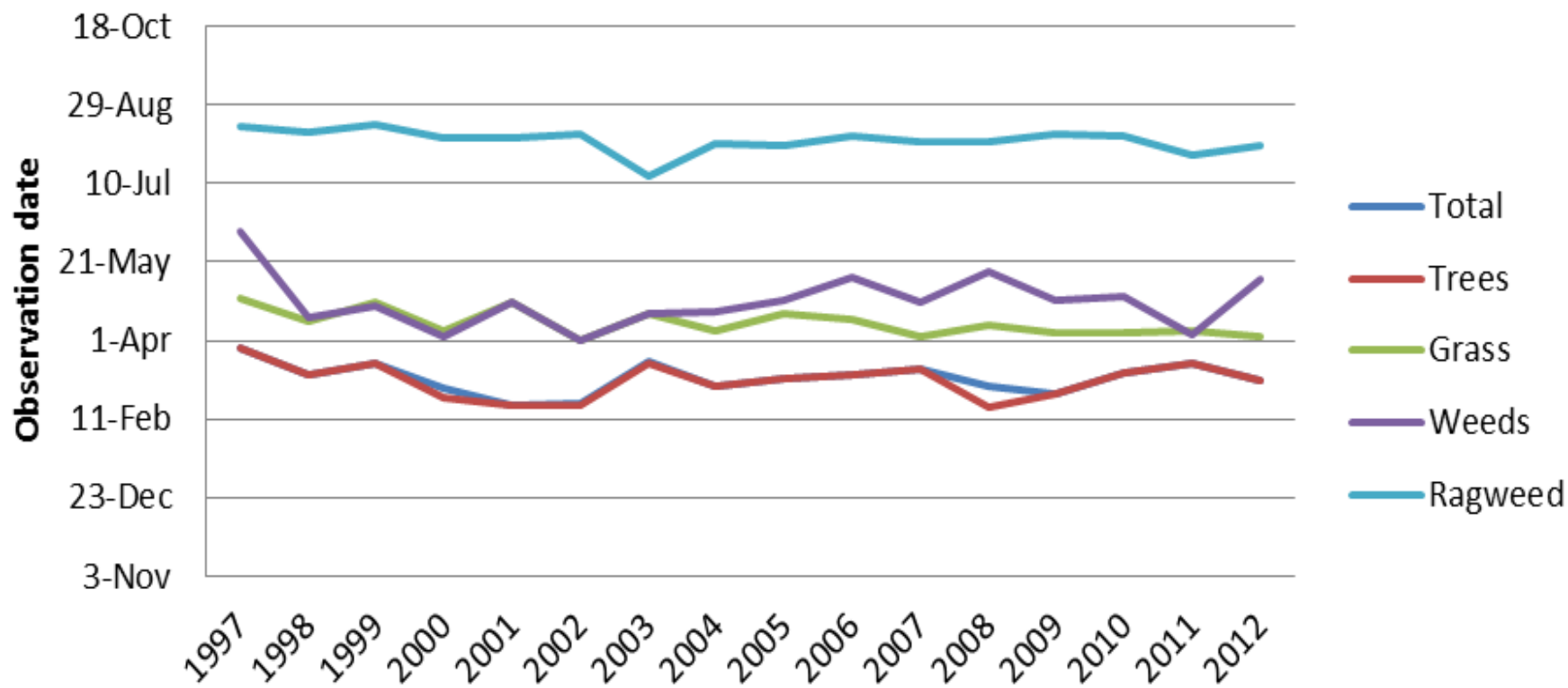
- Measure(s)

1. Date when the pollen season started, by pollen source (i.e., trees, grass, weeds) in a calendar year
2. Date when the pollen season ended, by pollen source, in a calendar year
3. Length of pollen season, in days, by pollen source, in a calendar year (#2-#1)
4. Number and percent of days during the pollen season when pollen readings were categorically elevated (NAB categories of high or very high), by pollen source, in a calendar year
5. Mean, minimum and maximum daily pollen counts for the pollen season, by pollen source, in a calendar year
6. Pollen types (species) measured in a calendar year



Start of Pollen Season

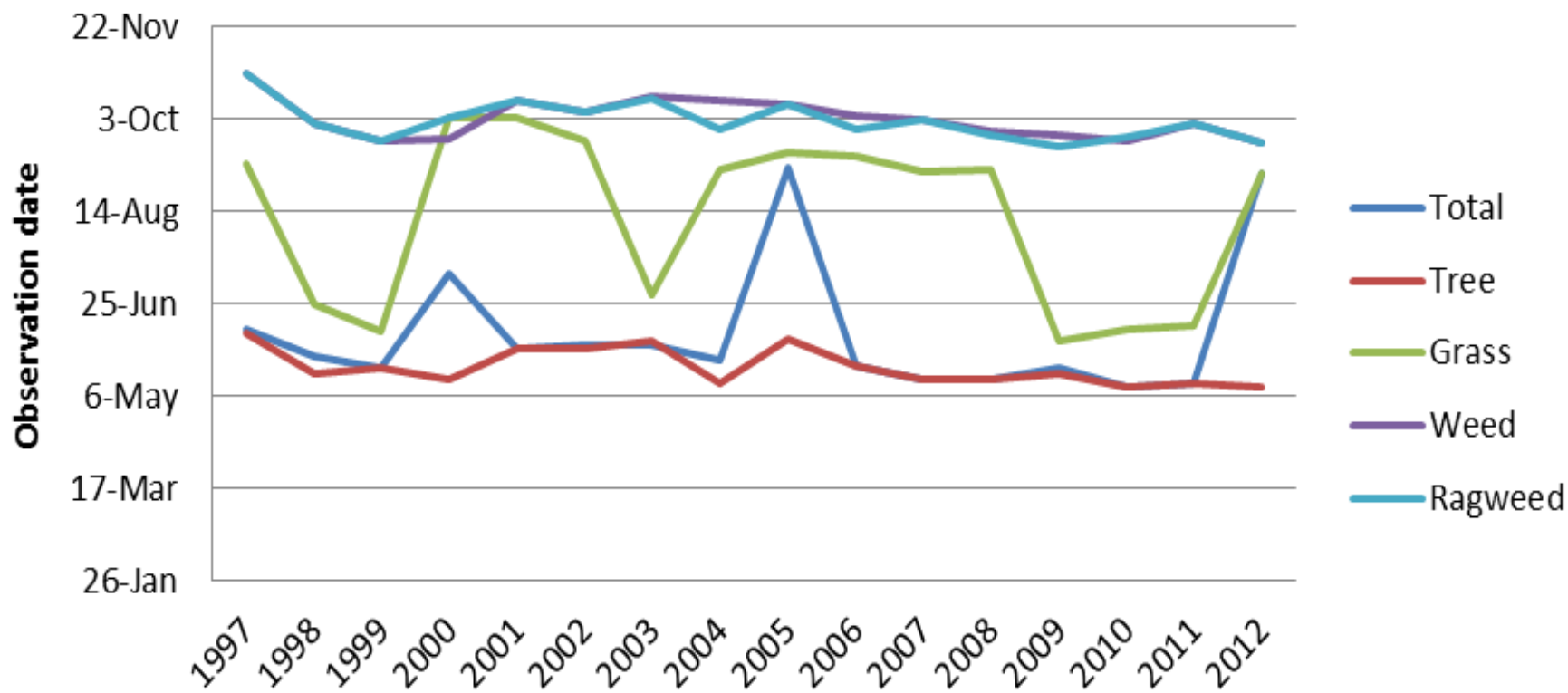
Start Date of Pollen sources by year





End of Pollen Season

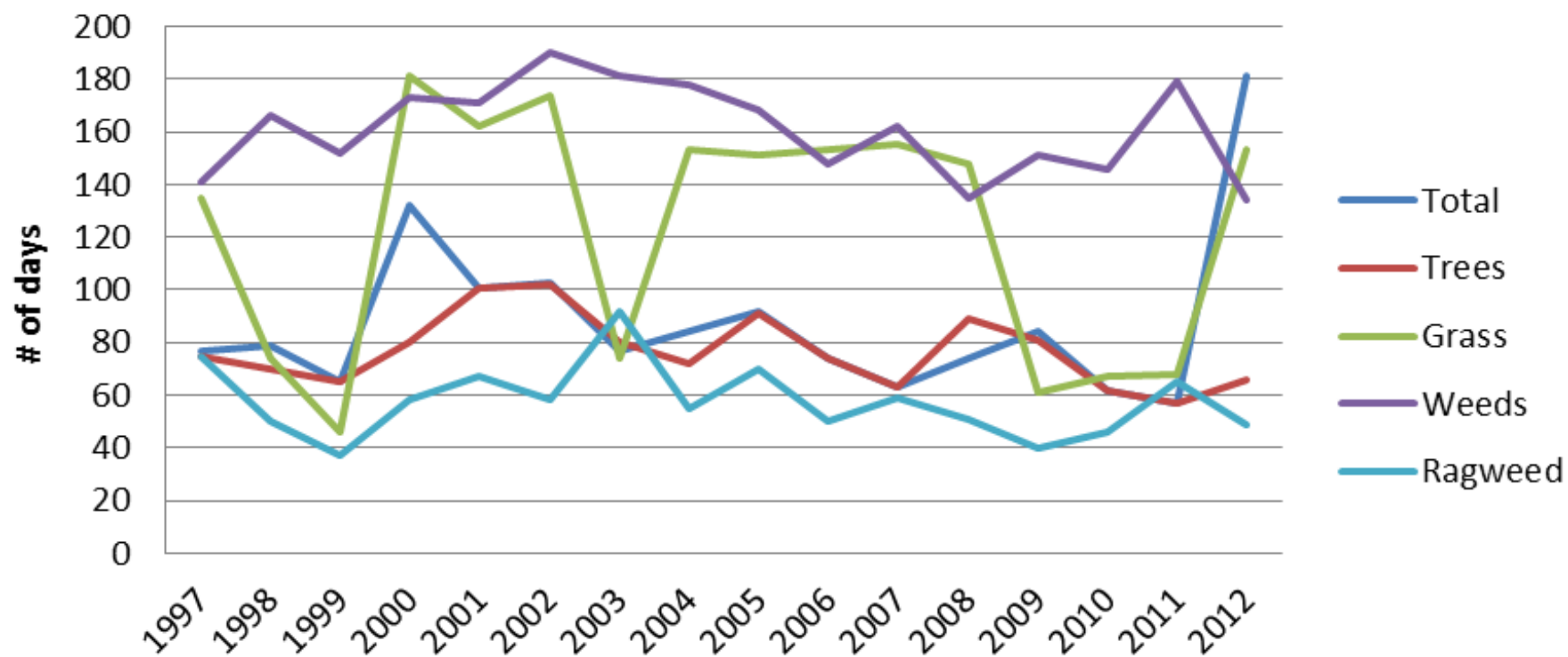
End Date of Pollen sources by year





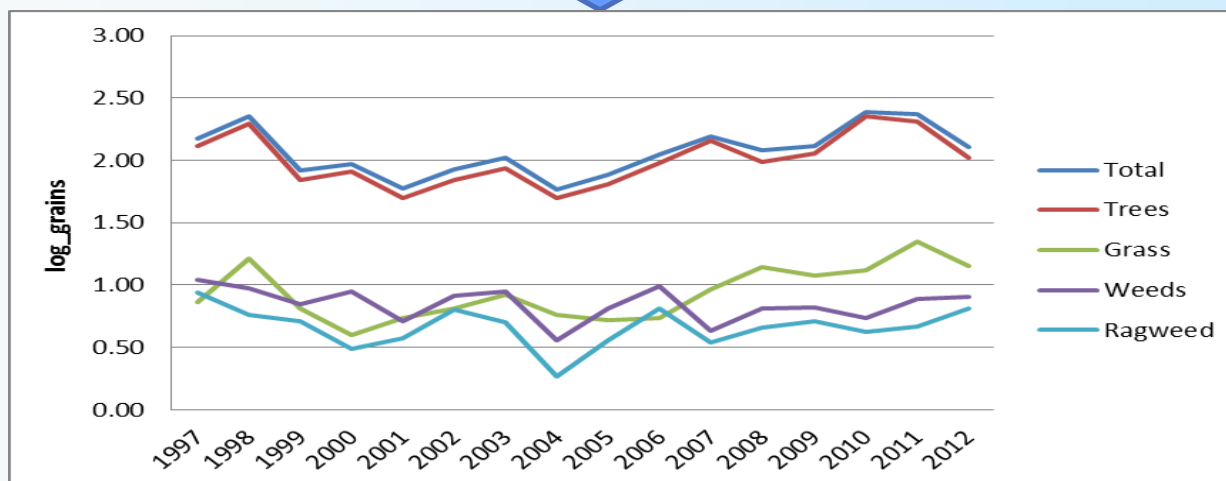
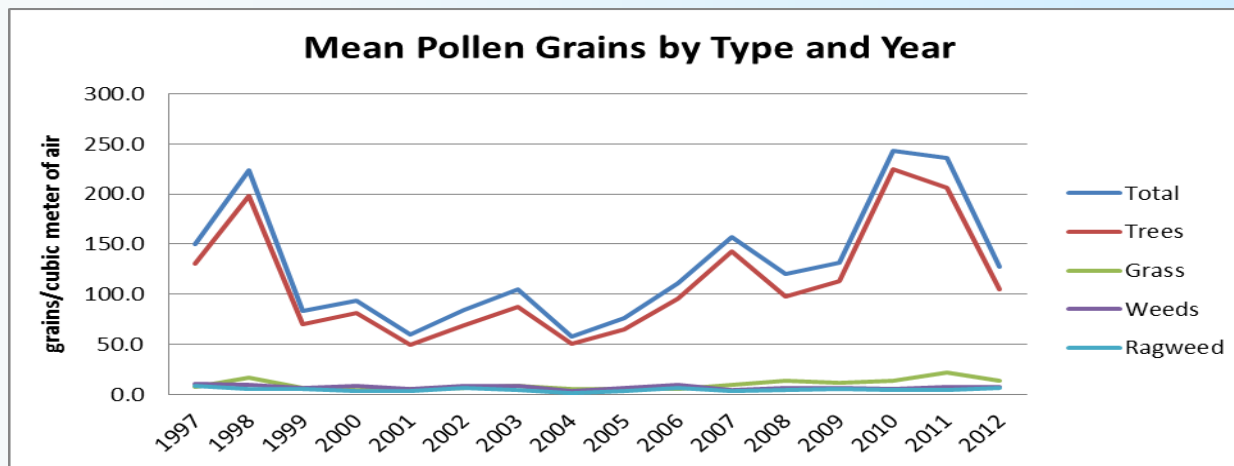
Length of Pollen Season

Duration of Pollen Season by Pollen Type and Year



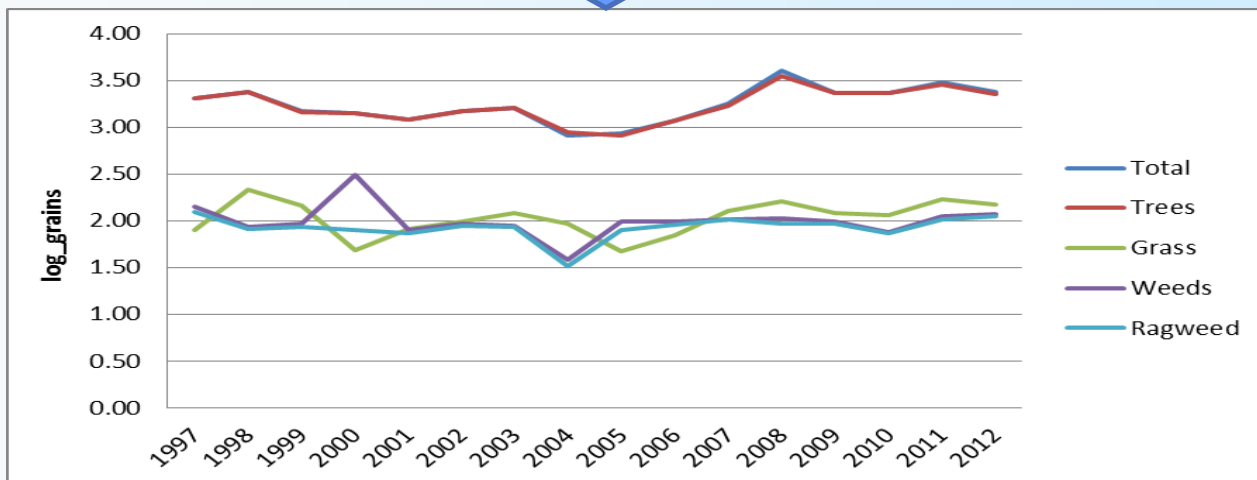
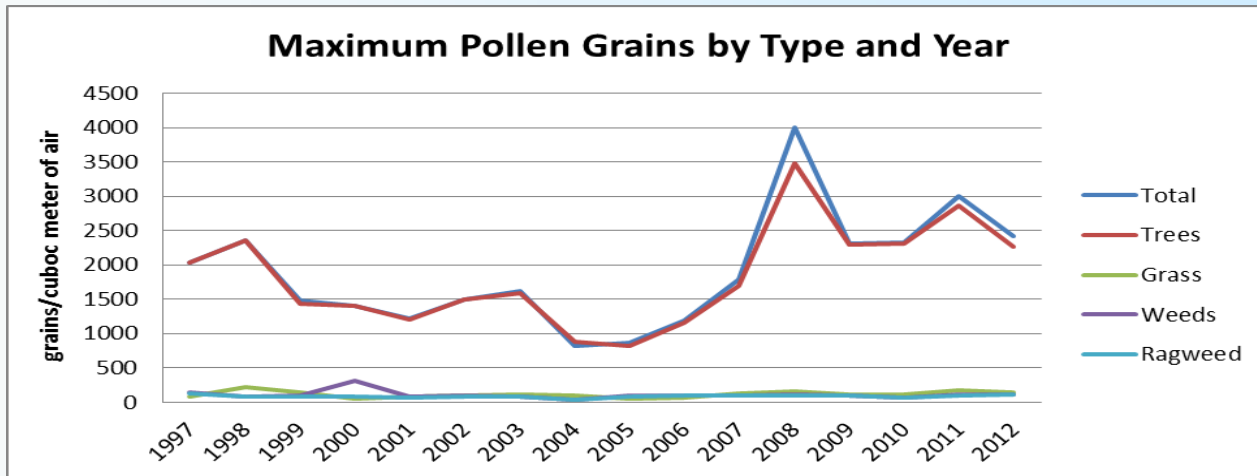


Mean (Log) Pollen Grains by Type and Year





Maximum (Log) Pollen Grains by Type & Year





Correlation between. Pollen and Temperature with and without Controlling for PM_{2.5} and O₃

	Correlation Coefficient				Partial
		Temperature	PM _{2.5}	O ₃	Temperature
Pollen (Average)	Total	-0.10*	-0.37*	0.13*	-0.35*
	Tree	-0.14*	-0.37*	0.11*	-0.39*
	Grass	0.26*	-0.16*	0.29*	0.07*
	Weed	0.40*	-0.01	0.07*	0.57*
	Ragweed	0.29*	-0.16*	-0.08*	0.58*

* Significant at $p < 0.05$

- Temperature shows a positive correlation with grass, weed, and ragweed pollen, but a negative correlation with total pollen and tree pollen; this could be due to a seasonal effect.
- Temperature itself also shows positive correlation with grass, weed, and ragweed pollen after controlling effect modifiers fine PM and ozone.



Change in Disease Outcomes

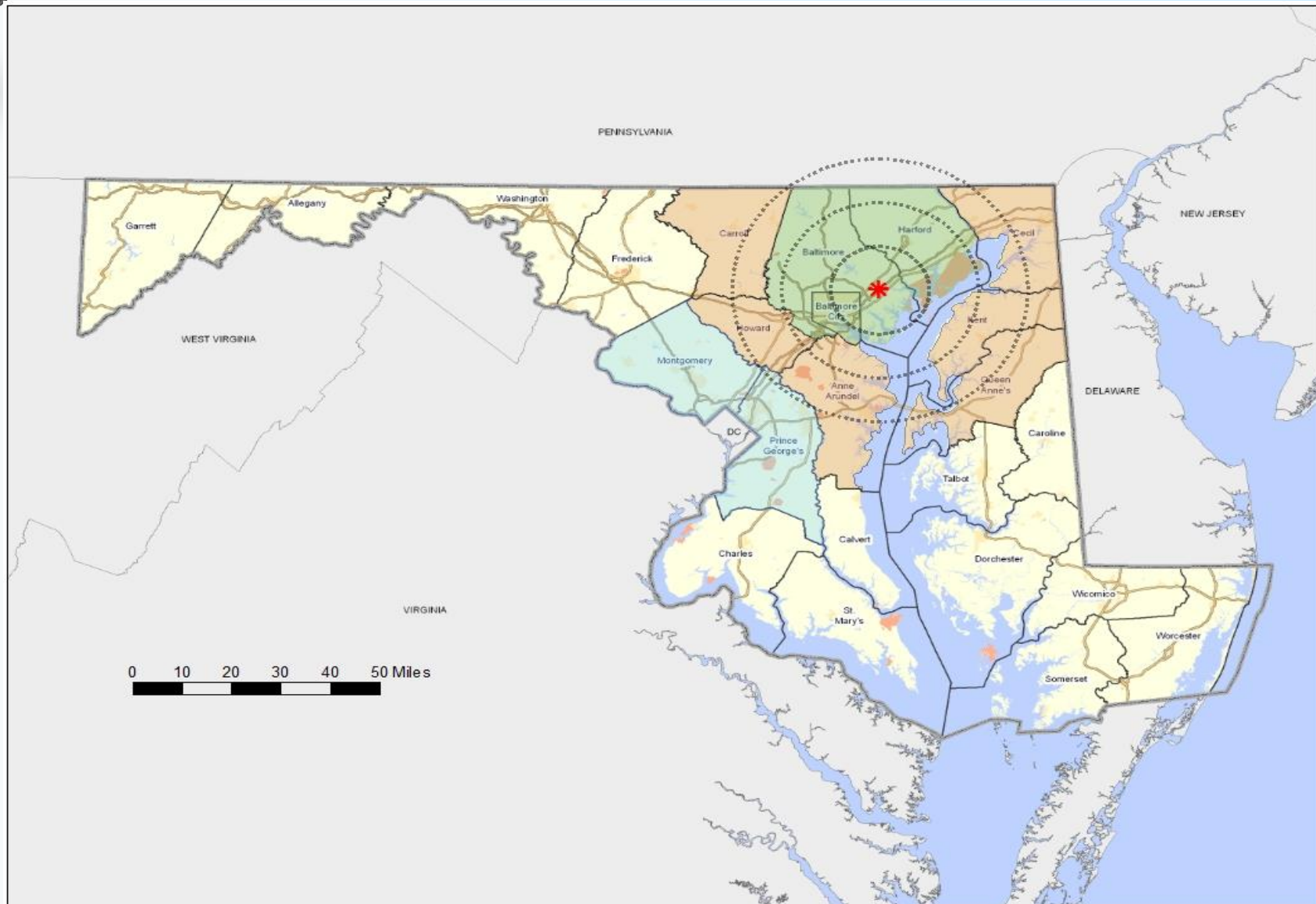
	Asthma			Allergic Rhinitis			Finger wounds		
Year	OR	95% CI		OR	95% CI		OR	95% CI	
2001	1.09	0.95	1.24	5.76*	4.15	7.99	0.86	0.81	0.92
2002	0.99	0.85	1.15	6.86*	5.01	9.38	0.83	0.78	0.90
2003	1.08	0.94	1.25	7.85*	5.78	10.65	0.86	0.80	0.92
2004	1.18*	1.02	1.37	11.04*	8.13	14.99	0.84	0.78	0.90
2005	1.20*	1.03	1.41	10.73*	7.87	14.64	0.80	0.74	0.87
2006	1.10	0.95	1.27	9.18*	6.77	12.45	0.74	0.69	0.80
2007	1.23*	1.06	1.42	9.33*	6.85	12.71	0.69	0.64	0.75
2008	1.06	0.90	1.24	8.17*	5.98	11.16	0.64	0.60	0.70
2009	1.09	0.94	1.28	9.41*	6.90	12.82	0.58	0.54	0.63
2010	1.20*	1.00	1.45	10.17*	7.32	14.11	0.53	0.49	0.59

* Significant at $p < 0.05$

- ORs for Asthma increased annually from year 2003 as compared to year 2000 (ref), especially it had increased significantly in year 2004, 2005, 2007, and 2010.
- ORs for Allergic rhinitis had increased significantly every year since year 2001 as compared to year 2000.



Maryland





Distance Effect

	Asthma			Rhinitis			Finger		
	OR	95% CI		OR	95% CI		OR	95% CI	
Distance 0-10	2.81*	2.66	2.97	1.74*	1.65	1.84	1.30*	1.26	1.35
Distance 11-20	1.22*	1.14	1.32	0.86*	0.80	0.92	1.28*	1.23	1.33

Unit: miles

* Significant at $p < 0.05$

- Asthma: OR for distance within 0-10 miles is 2.8 times greater than distance within 21-30 miles (ref), for distance within 11-20 miles is merely 22% greater than distance within 21-30 miles.
- Allergic rhinitis: OR for distance within 0-10 miles is 74% greater than distance within 21-30 miles, but OR for distance within 11-20 miles is 14% less than distance within 21-30 miles.



Contributors

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